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EMISSIVE MECHANSIM OF RADIO FLAT SPECTRUM ON X-RAY BINARIES Jiancheng Wang

Yunnan Observatory, Chinese Academy of Sciences, P.O. Box 110, Kunming, Yunnan Province, 650011, P.R. China National Astronomical Observatories, Chinese Academy of Sciences United Laboratory of Optical Astronomy, Chinese Academy of Sciences jcwang@public.km.yn.cn

abstract We present that the radio emission with flat spectrum in X-ray binaries comes from the synchrotron emission of relativistic electrons in the high energy tail of hot electrons in continuous conical jet. The jet is assumed to be produced by the advection-dominated accretion flow (ADAF) and maintains ion and electron temperatures constant in the case of adiabatic steady conical expansion. The flat spectrum is result of self-absorbed synchrotron emission by relativistic thermal electrons. We find that the critical frequency at which the radiation becomes optically thin declines along the jet. The emission observed at higher frequencies originates at smaller distance, closer to the base of the jet. The highest cut-off frequency of the flat spectrum is at the base of the jet, and is determined by the physics of the ADAF and the position of the jet formation. We assert that it is a characteristic of the ADAF in black hole X-ray binaries that a continuous steady outflow is formed and causes the observed flat spectrum in the low/hard state. The observed synchrotron emission consists of the flat spectral component from the jet and the steep spectral component from the ADAF. The flat spectral component extends from infrared to radio wavelengths, while the steep spectral component with the 2/5 spectral slope extends from infrared to shorter wavelengths, it will be dominated by the thermal emission from companion star.